

FOAM MATERIAL MODULAR TOY STRUCTURE

BACKGROUND OF THE INVENTION

1) FIELD OF THE INVENTION

The invention herein relates to DIY-assembly toys, specifically a foam material
5 modular toy structure in which solid foam components have octagonal through-holes and
projecting umbrella-shaped tenons for repeated assembly and disassembly according to
the creativity of the user such that the resulting toy is capable of lively, flexible
operational performance.

2) DESCRIPTION OF THE PRIOR ART

10 Conventional DIY-assembly toys allow users to replicate or give form to
personally perceived space or individual creativity to achieve cognitive development and
stimulation objectives. To young children in the stage of extreme interest in the external
physical world and even for older children who are starting to have their own thoughts,
such playthings promote intellectual conceptualization, awareness, and transformation
15 and, therefore, are of positive assistance to both preschool and school age children.

DIY-assembly toys now observed on the market are typically fabricated of plastic
and wood materials; in the case of wood materials, since they are obtained from trees,
large volume utilization results in a rapid resource consumption and tree growth does not
occur over such a short period that the supply is endless; in addition, since trees regulate
20 overall environmental air quality, protect global surface water reserves, and other aspects
that affect mankind, if depleted by massive volumes of deforestation, then the growth of
living things in the entire global environment will suffer differing degrees of damage;
although assembled toys only use a small percentage of wood, if every industry adopted

the attitude of protecting precious environmental resources by reducing amounts utilized or substituted other materials in manufacturing, this would be significant for global resources. Additionally, since children often do not understand normal usage, assembly-type toys constructed of wood material incur damage, including broken corners or bent
5 and broken non-movable parts (due to very thin members of wood), the situations of improper use result in physical harm to children, a moment of inattention risking injuries ranging from superficial cuts with minor swelling to bleeding puncture wounds; furthermore, assembly-type toy utilization and operation of course entails "assembly and installation" tasks, but assembly toys constructed of wood material only use peripheral
10 grooves for insertional conjoinment (as shown in FIG. 1), the entire toy thereby ending up in a rigid angular state without active variation capability, which generally fails to stir the attention and interest of children, who only need operate it once to realize the lack of amusement value, following which the said toy would be set aside; or if moved and picked up, an entire assembly-type toy not having a durable arrangement simply loosens
15 and falls apart, and as such must be reassembled or if not possible, completely disassembled and put away.

Plastic material construction of course solves the problem of wood resource depletion and such toys are more difficult to damage and have other advantages, but during assembly one discovers that when any two toy pieces are conjoined, a large
20 headed male fitting is positioned by insertion through the hole of a female fitting such that loosening and dislodging does not easily occur during movement, resulting in extreme difficulty when storage and disassembly is required; pulling them apart involves great persistence, frictional wear occurs after a certain period such that the male fitting becomes smaller and the female fitting grows larger, with conjoinment into fixed

position no longer possible after a while; additionally, since conjoining pairs of fittings into position was possible at the beginning, children often playfully turn the axially rotatable areas such that stationery positioning capability is lost after a certain period of time due to frictional wear between pairs of hard plastic bodies and as the parts of the toy
5 are turned during utilization, the said toy eventually crumples onto the floor because of its weight, illustrating that conventional assembly-type toys are only capable of attracting the interest of children for a brief period, following which they are ignored.

In view of the said elaboration, the applicant of the invention herein devoted substantial effort to improve the said drawbacks, culminating in the successful
10 development of the present invention, which is submitted as a new patent application.

SUMMARY OF THE INVENTION

The primary objective of the invention herein is to provide a foam material modular toy structure consisting of differently shaped solid components fabricated from a foam material, wherein each solid foam component has an octagonal through-hole and
15 a projecting umbrella-shaped tenon, enabling the user to assemble them based on their own creativity; the joints formed by umbrella-shaped tenons and the octagonal through-holes enables articulation at a range of angles and maintenance at fixed positions without collapsing due to weight factors; and since foam material has inherent elasticity, the joint areas enable release for disassembly and knockdown to reduce space occupancy and
20 facilitate storage, the invention herein thereby capable of providing for repeated creative assembly as well as lively, flexile operational performance.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an isometric drawing of the prior art.

Figure 2-A is an exploded drawing of the invention herein.

Figure 2-B is a magnified view of the invention herein.

5 Figure 3 is an isometric drawing of the invention herein.

Figure 4-A is an orthographic drawing of the invention herein.

Figure 4-B is an orthographic drawing of the invention herein following assembly.

Figure 4-C is an orthographic drawing of the invention herein before rotation.

10 Figure 5 is an orthographic drawing of an embodiment of the invention herein.

Figure 6-A is an exploded drawing of another model of the invention herein (1).

Figure 6-B is an isometric drawing of the other model of the invention herein (1).

Figure 7-A is an exploded drawing of another model of the invention herein (2).

Figure 7-B is an isometric drawing of the other model of the invention herein (2).

15 Figure 8-A is an exploded drawing of another model of the invention herein (3).

Figure 8-B is an isometric drawing of the other model of the invention herein (3).

DETAILED DESCRIPTION OF THE INVENTION

Referring to FIG. 2-A, FIG. 2-B, and FIG. 3, the foam material modular toy structure of the invention herein consists of differently shaped solid components fabricated from a foam material, the said solid foam components 1 are fashioned into the constituent parts of various animals, plants, and other product objects that are assembled into complete three-dimensional models, wherein each solid foam component 1 has an octagonal through-hole 11 and a projecting umbrella-shaped tenon 12, or a connecting rod 2, the two extremities of which have umbrella-shaped tenon 22 and an octagonal through-hole 21 similar to the umbrella-shaped tenon 22 and octagonal through-hole 11 of the solid foam component 1; as such, the user can assemble quantities of the said solid foam components 1 having the elastic umbrella-shaped tenons 12 as well as the umbrella-shaped tenons 22 and octagonal through-holes 21 at the two extremities of the connecting rod 2 by inserting them into the octagonal through-holes 11 of other solid foam components 1 (as shown in the FIG. 3 and FIG. 4-A), enabling the children to recognize and be impressed by the said object.

The umbrella-shaped tenon 22 and octagonal through-hole 11 in each solid foam component 1 along with the connecting rod 2 umbrella-shaped tenons 22 and octagonal through-holes 21 are thereafter insertionally fitted together to provide for rotationally controlled joint applications, while the umbrella-shaped tenon and octagonal through-holes utilize rotational corner contact to achieve a rigid appearance (as shown in FIG. 4-B and FIG. 4-C), each solid foam component 1 capable of being articulated at a range of angles and kept in a fixed position without collapsing due to weight factors, as indicated in FIG. 5; when rotated, since the immobilizing contact of the umbrella-shaped tenons and octagonal through-holes is elastic because of the foam material and does not involve

convergence between two hard materials, there is no rapid wear and consequent slippage due to revolving, providing for prolonged continual rotation.

As such, since the invention herein does not contain wood and is fabricated of a foam material, the depletion of such precious resources is not a concern; furthermore, the advantages of foam material construction include component durability, lighter weight than plastic, resilience, wider application range, and greater utility than plastic, especially in terms of long-term constant rotational operation, angular articulation, and rigidity without collapsing due to weight factors as might be the case for other materials, enabling the assembled toy to be flexible, lively, and consequently stimulate a child's interest and operation. Additionally, since foam material has inherent elasticity and the umbrella-shaped tenons 12 and 22 can be manually withdrawn from the octagonal through-holes 11 and 21, the entire toy is easily disassembled into constituent parts to reduce space occupancy and facilitate storage.

By the same principle, each solid foam component 1 can be fabricated into the anatomical members of the various animals (as shown in FIG. 6-A, FIG. 6-B, FIG. 7-A, and FIG. 7-B) or other interchangeable parts (as shown in FIG. 8-A and FIG. 8-B) such that the user is afforded the opportunity to creatively connect the holes in the solid foam components 1 by means of the umbrella-shaped tenons 21 at the two extremities of the connecting rod 2, thereby achieving the objectives of stimulating intellectual thought and development.

In summation of the foregoing section, since the invention herein is capable of providing for repeated creative assembly as well as lively and flexile operational performance, the present invention meets new patent application requirements and is submitted to the patent bureau for review and the granting of the commensurate patent

5 rights.